



Figure 5 is a photographic image of a coal-base cellular product incorporating differing cell sizes in the shape of the letter T.

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Detailed Description

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According to the method described in aforementioned U.S. Patent

Application Serial No. 09/453,729, a low density, i.e., from about 0.1 to about 1.0g/cm³, and preferably from about 0.2 to about 0.5g/cm³, coal-based cellular product is produced from powdered coal particulate preferably less than about 1mm in diameter by the controlled heating of the powdered coal in a "mold" under a non-oxidizing atmosphere. The starting material coal may include bitumen, anthracite, or even lignite, or blends of these, but is preferably bituminous, agglomerating coals that have been comminuted to an appropriate particle size, preferably to a fine powder below about -60 to -80 mesh. As used herein, the term "coal-based" is meant define that the cellular products described herein are prepared or manufactured by the "controlled swelling" of ground or comminuted coal.

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The resulting cellular material was cut to reveal the graded cellular structure shown in Figure 3.

Example 4

5 An NMP (n-methyl pyrrolidone) extract of a low volatile bituminous coal was ground until all material passed through a 60-mesh screen. It was loaded into a ceramic mold and heated slowly to a temperature of 475°C and held for seven hours. The exterior material volatilized first and was pushed outward to the mold surface by the expanding interior giving rise to the pronounced "skin-core" structure shown in Figure 4.

Example 5

10 A high volatile bituminous coal was ground and sieved to produce two distinct particle sizes. The first (1) passed through a 60 mesh screen and the second (2) through a 35 mesh but not a 60 mesh screen. A T-shaped mold was constructed from paper and centered in a cylindrical steel mold. The relative areas of the T and the surrounding mold were used to determine the amounts of each material used. In one case, fraction 1 was loaded into the T and fraction 2 into the surrounding mold. In the second case, fraction 2 was loaded into the T and fraction 1 into the surrounding mold. Both were heated to 475°C at a heating rate of 2°C per minute and held at this temperature for seven hours. The resulting cellular materials were cut to reveal the linearly-graded cell structure shown in Figure 5.